Everything you wanted to know about E85, and then some!

Presented by URS Corporation

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Consumer Choice

"What can I do?"

First, recycling . . . Now, fuels & vehicles

- **Consumers looking for a choice**
- **Vehicles & fuels**
- **Value of air quality**
- **The time is right**

Government Leadership

Why Alternative Fuels?

- **Federal Requirements:**

Energy Policy Act of 1992

Federal Fleets:

- **75% of new vehicles acquired for use must be AFVs**
- **Executive Order 13149 April 21,2000**
- **"Greening the Government" Reduce consumption of petroleum by 20% from 1999 to end of FY 2005**

Why Alternative Fuels?

- **Federal Requirements:**

Energy Policy Act of 1992

State Fleets:

- **75% of new vehicles acquired for use must be AFVs**
- **Other state and local initiatives**

What is Ethanol (E85)?

- E85 is a blend of 85% ethanol and 15% gasoline
- High octane, liquid, domestic and renewable fuel
- Ethanol is produced from corn, cheese whey, wheat, sorghum and beverage wastes
- Many producers are farmer-owned cooperatives located in rural communities
- Ethanol also produced from waste

- Burns cleaner than gasoline
- Contains ~80% less of the potential contaminants found in gasoline (example: benzene, xylene, sulfur)
- Contains ~80% less of the gum-forming compounds found in gasoline (example: olefins)
- Gallon for gallon, E85 has 75% of the energy content of gasoline
- Loss of fuel mileage of 5 to 10 percent

Consumer Benefits of E85

- Costs less to fuel an FFV with E85 than with gasoline E85 is typically priced less than gasoline at the pump
- Increased horsepower (+5%)
- No additional cost to own a FFV
- OEM produced & warranted same as gasoline-only models
- Fuels just like gasoline, requires no additional training

- 25% reduction in smog-forming pollutants
- 35% - 40% reduction in greenhouse gas emissions
- Increased life-expectancy/cleaner engine & fuel system
- Renewable fuel made from agricultural crops & wastes
- Reduction in our dependence on overseas oil imports

What is an FFV?

- **Flexible fuel vehicle (FFV) specially designed to run on any ethanol blend up to 85%.**
- **FFVs may use any mix of gasoline or E85 – from 100% unleaded gasoline to 100% E85**
- **FFVs experience a mileage reduction on E85 vs gasoline**
- **The Engine Control Module "reads" the fuel blend, enabling drivers to fuel with E85 or gasoline in any combination.**

- The computer adjusts the FFV's fuel injection and ignition timing to compensate for different fuel mixtures.
- There are no switches, no mixing or blending required.
- All fueling done in same fuel "filling system".
- No special training needed to fuel vehicle.
- No additional fuel tanks or loss of trunk space.
- No on-board storage tanks other than OEM tank

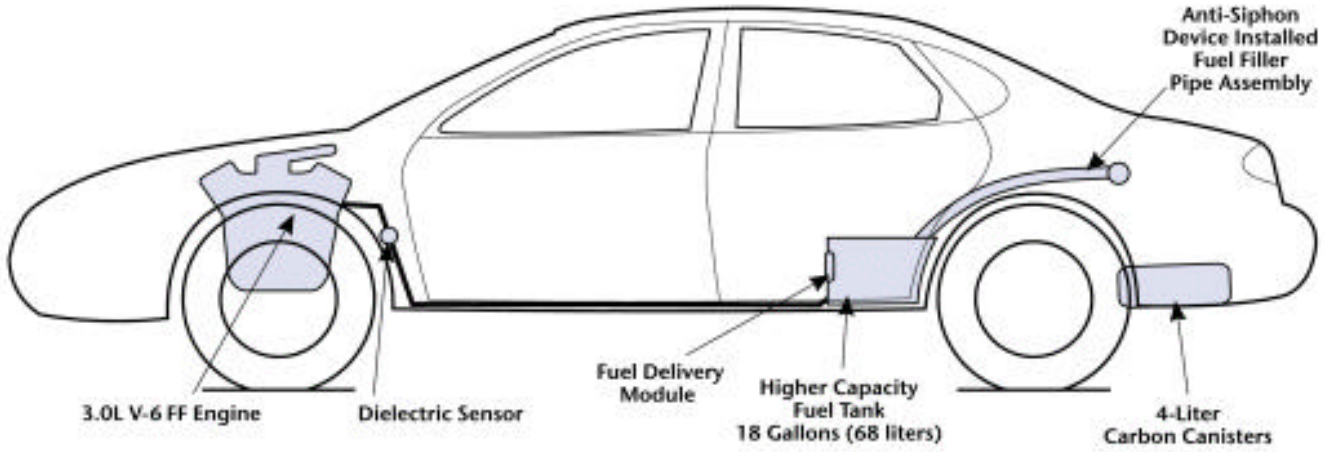
So, where do I get E85?

- Ethanol is shipped from plant as denatured ethanol by truck, barge, or rail
- Denatured ethanol - poisoned to prevent human consumption
- Stored at terminals in 95% blend
- Blended (mixed) with gasoline for E10 and for RFG and oxy-fuels
- Any terminal that offers E10 can produce E85
- $0.54 per gallon tax “incentive” at wholesale basis

What's different in an FFV?

- Fuel sensor that detects ethanol/gasoline ratio
- Stainless steel fuel tank
- Teflon lined fuel hoses
- Slight modifications to:
  - Fuel injectors
  - Computer system
  - Anti-siphon device
- Customer 'flexibility' to choose either fuel

Flexible Fuel System



E85 Range: 250-340 miles

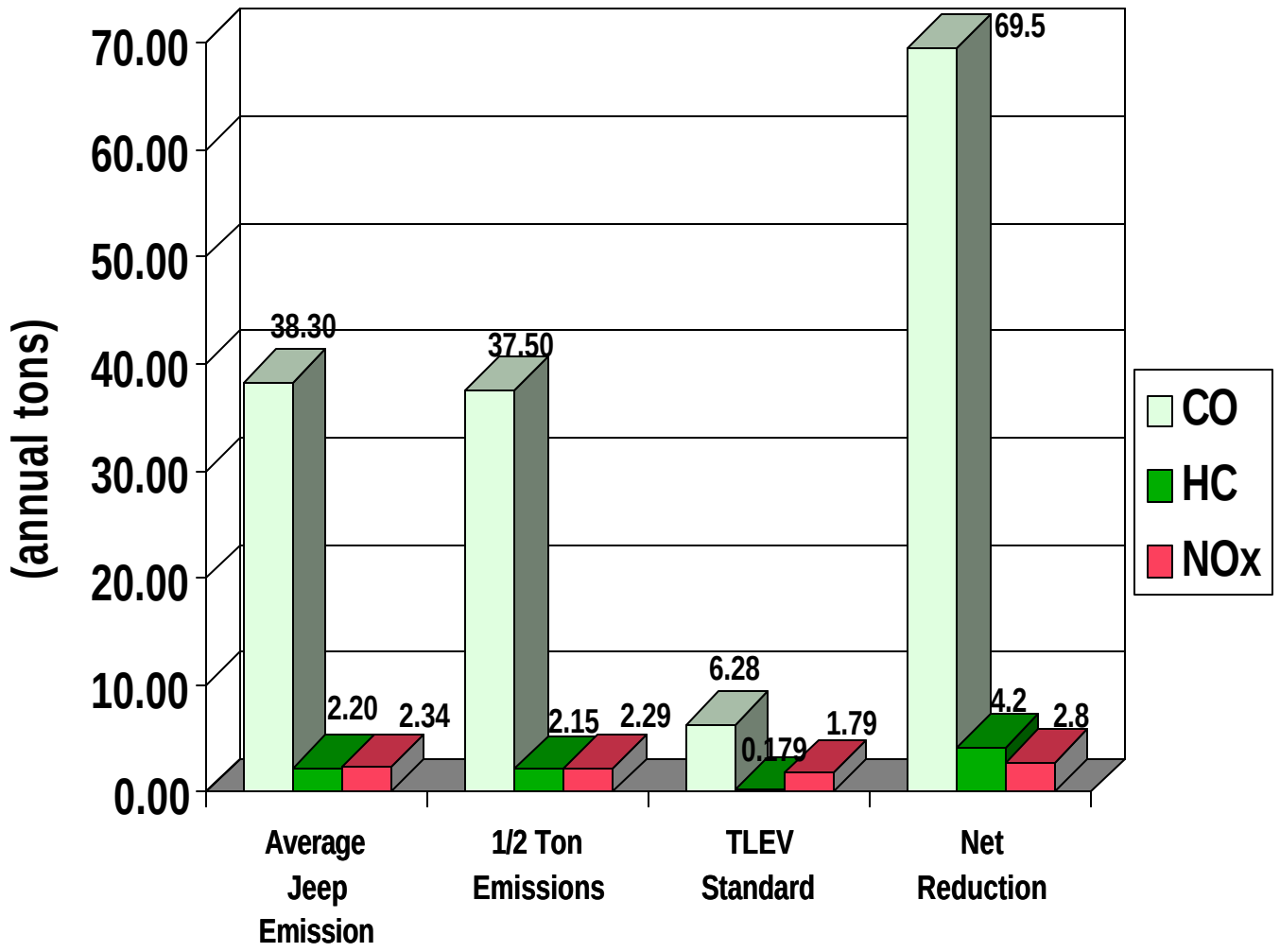
Gasoline Range: 340-470 miles

A mileage reduction will be experienced with E85 compared to gasoline

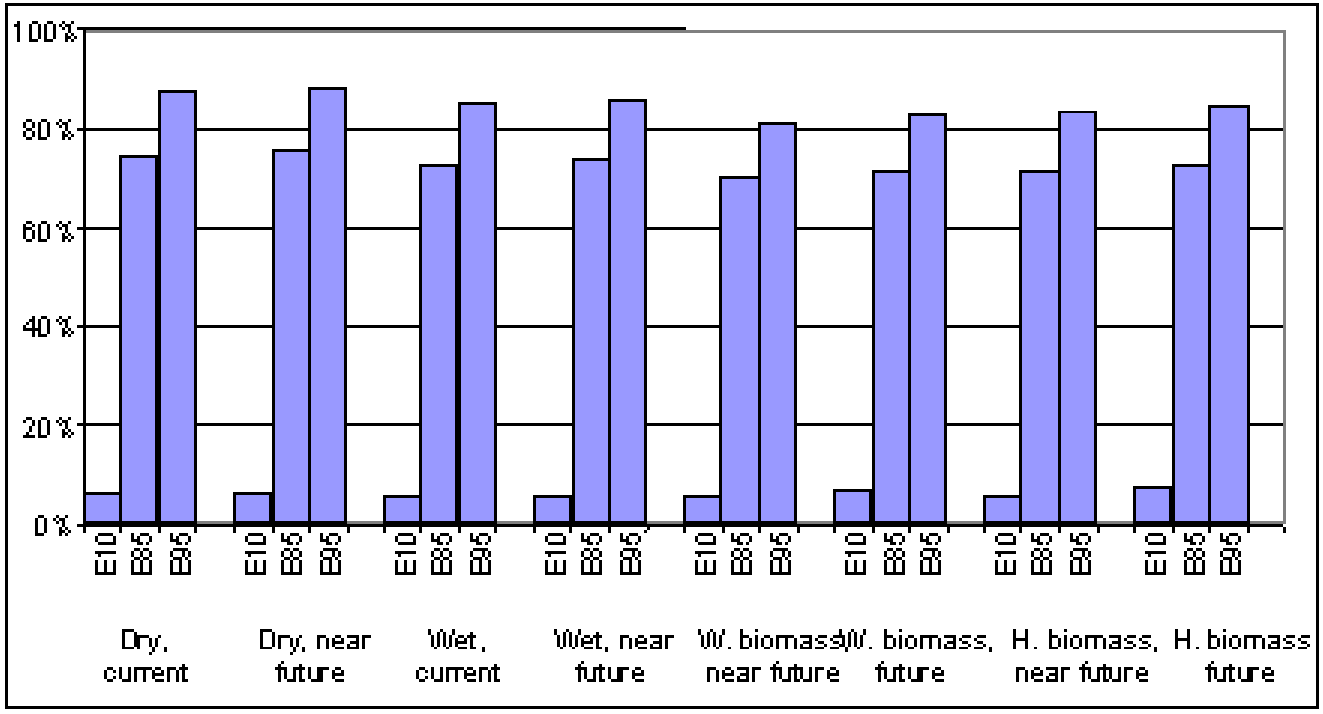
- 22,500 E85 delivery vehicles being delivered to USPS by Ford Motor Company

- Vehicles being placed across nation
  - Charlotte, NC 205 + 120
  - Fayetteville, NC 81 + 80
  - Greenville, SC 88
  - Columbia, SC 62
  - Charleston, SC 66
  - Denver, CO 810

JEEP & 1/2 TON EMISSIONS VS TLEV STANDARD

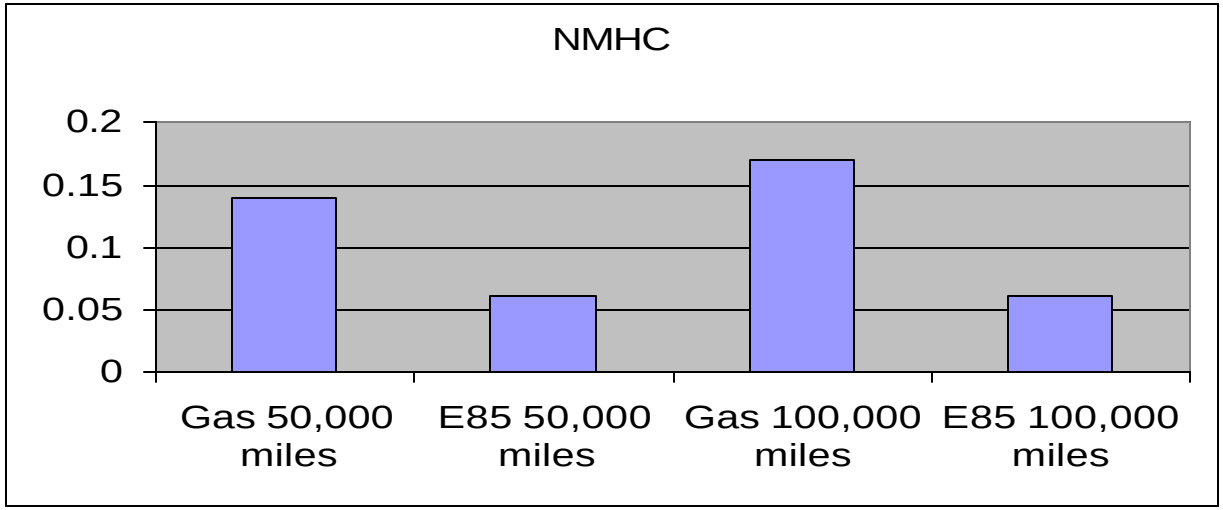


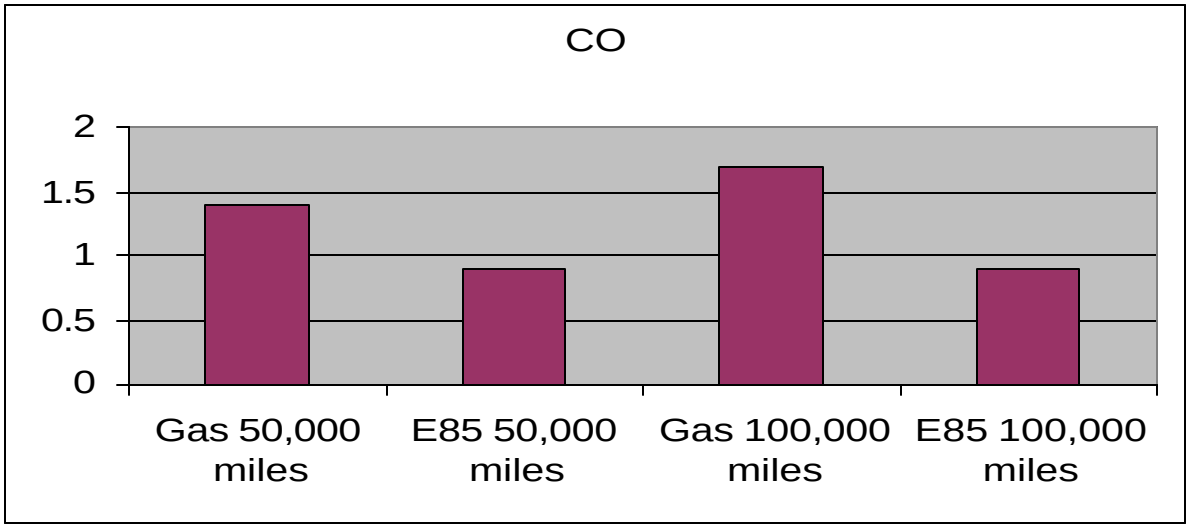
Effects of Ethanol Blends: Per-Mile Petroleum Use Changes (% Relative to Gasoline)



Argonne National Laboratory
Transportation Technology R&D Center

Taurus Emissions Gas vs E85 gms./mi.





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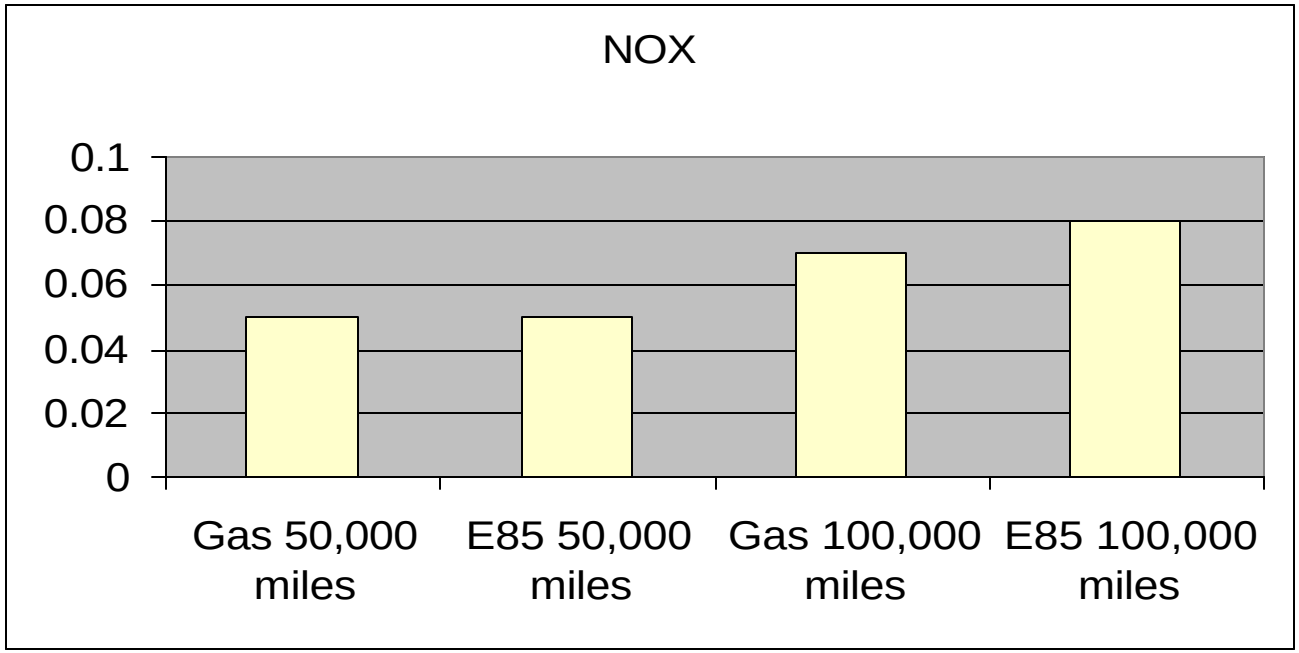
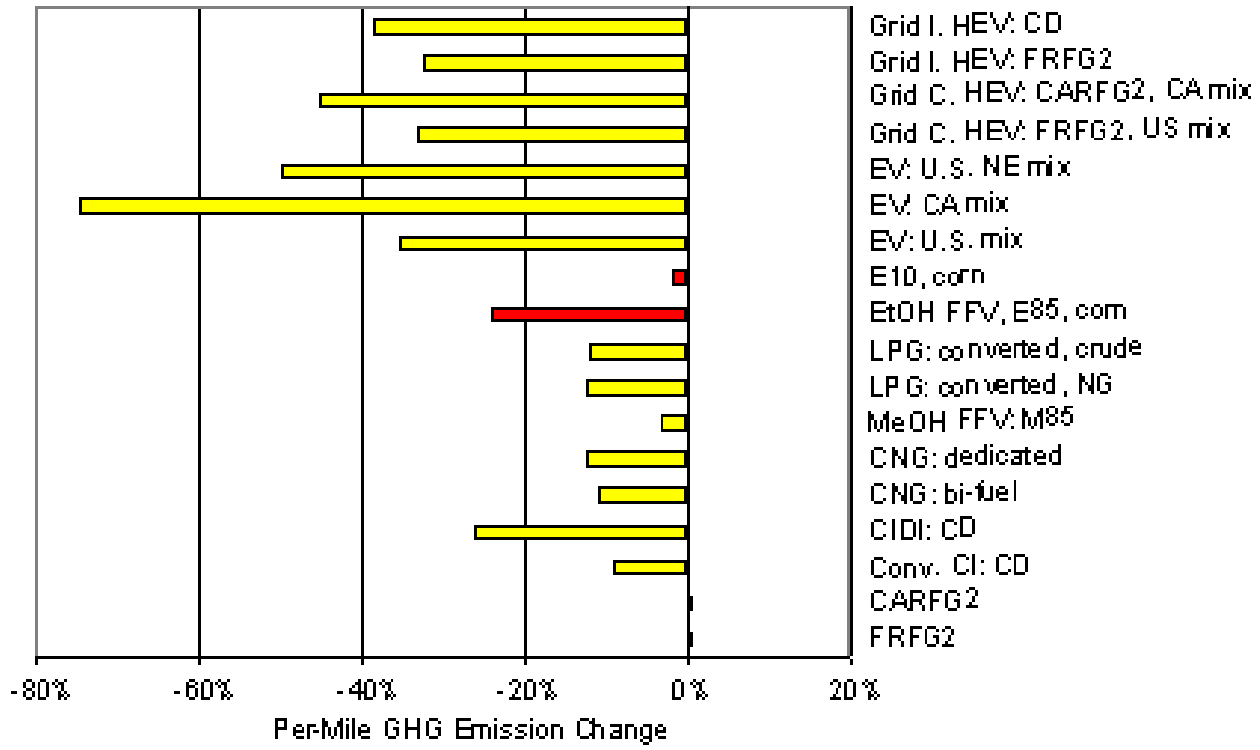


Slight increase in NOx is due to deterioration of catalyst system

Per-Mile Changes in Greenhouse Gas Emissions: Near-Term Cars (Relative to Tier 1 GVs)



Taurus FFV

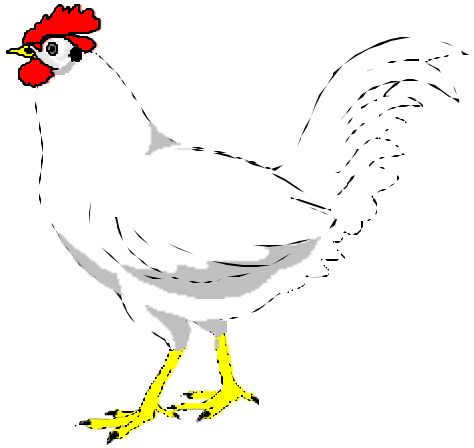
Sedan and wagon models with:

- **3.0L 2-valve V6 flexible fuel engine**
- **Electronic 4-speed automatic transmission**
- **18 gallon fuel tank**
- **Job 1 (11/6/00) -- Standard on LX, SE and SES for 2001 for Fleet orders. Retail – optional on LX**
- **LEV certified: it meets stringent emissions standards for non-methane organic gases (NMOG), oxides of nitrogen, and carbon monoxide for federal certification**
- **Earns Ford significant "CAFÉ" credit – allowing additional allocation of truck$ and SUV$!!**

Current E85 Models-2001

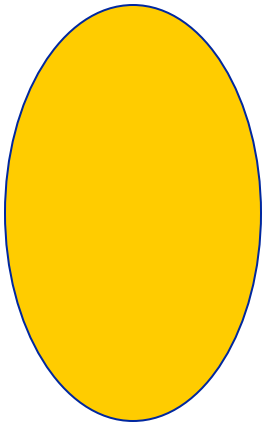
- All 2001 4.0L Explorers
- All 2001 4.0L Sport Tracks
- All 1999, 2000 and 2001 Ford 3.0L Ranger pickups
- All 1999 and 2000 Mazda 3.0L B3000 pickups
- All 2000 and 2001 Chevrolet 2.2L S-10 pickups
- All 2000 and 2001 GMC 2.2L Sonoma pickups
- All 1998, 1999, 2000 and 2001 DC 3.3L minivans
- All 2000 and 2001 Ford 3.0L Taurus LX, SE and SES sedans (also, many 1995-1999 3.0 L Taurus Sedans are FFVs)

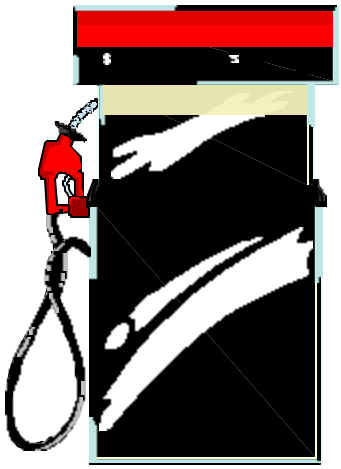
What comes first?

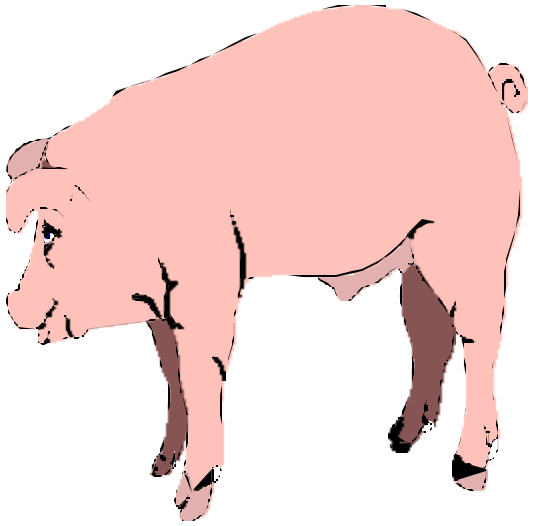


or

EGG







AND

Egg

Explorer Sport FFV

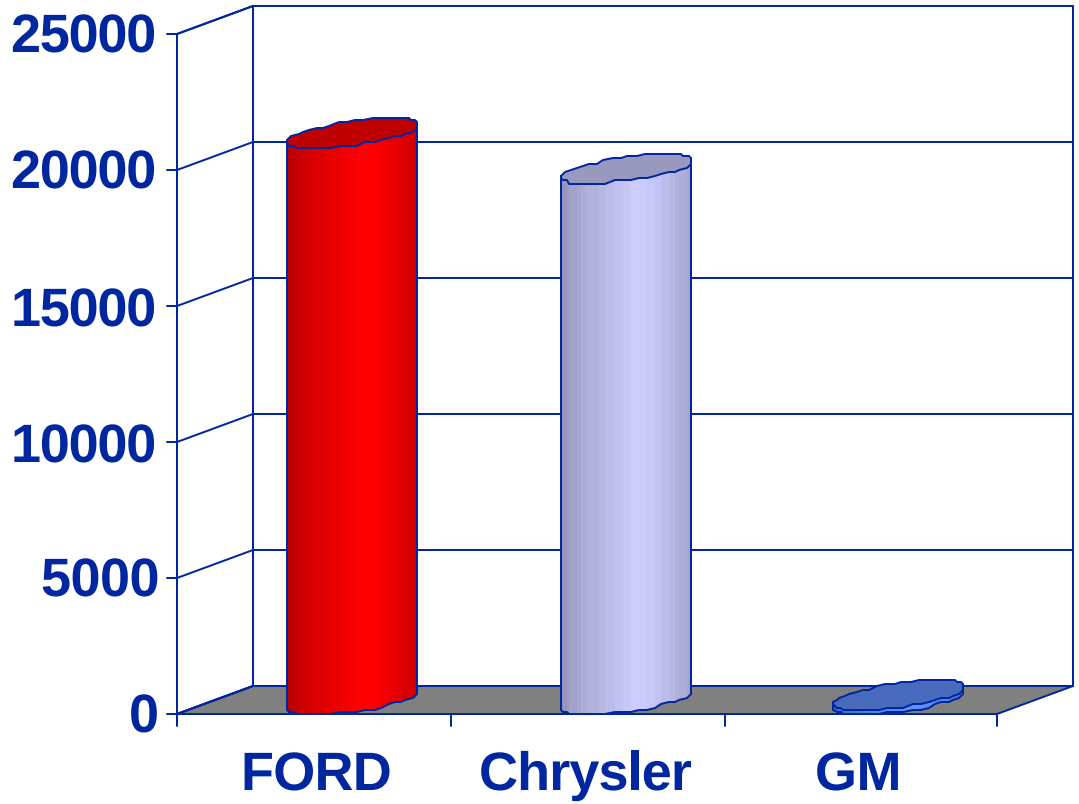
Explorer Sport Trac FFV

New for 2001

- Standard on models with 4.0L SOHC V6 engine
- FFV engine available January 2001
- 5-speed automatic transmission
- 17.5 gallon fuel tank for Sport
- 20.5 gallon tank for Sport Trac
- Explorer 4-door FFV scheduled for 2002MY
  - Available January 2001CY
  - New 22.5 gallon fuel tank (1.5 gal increase)

Registered FFVs in MN

Model Years 1998-2000



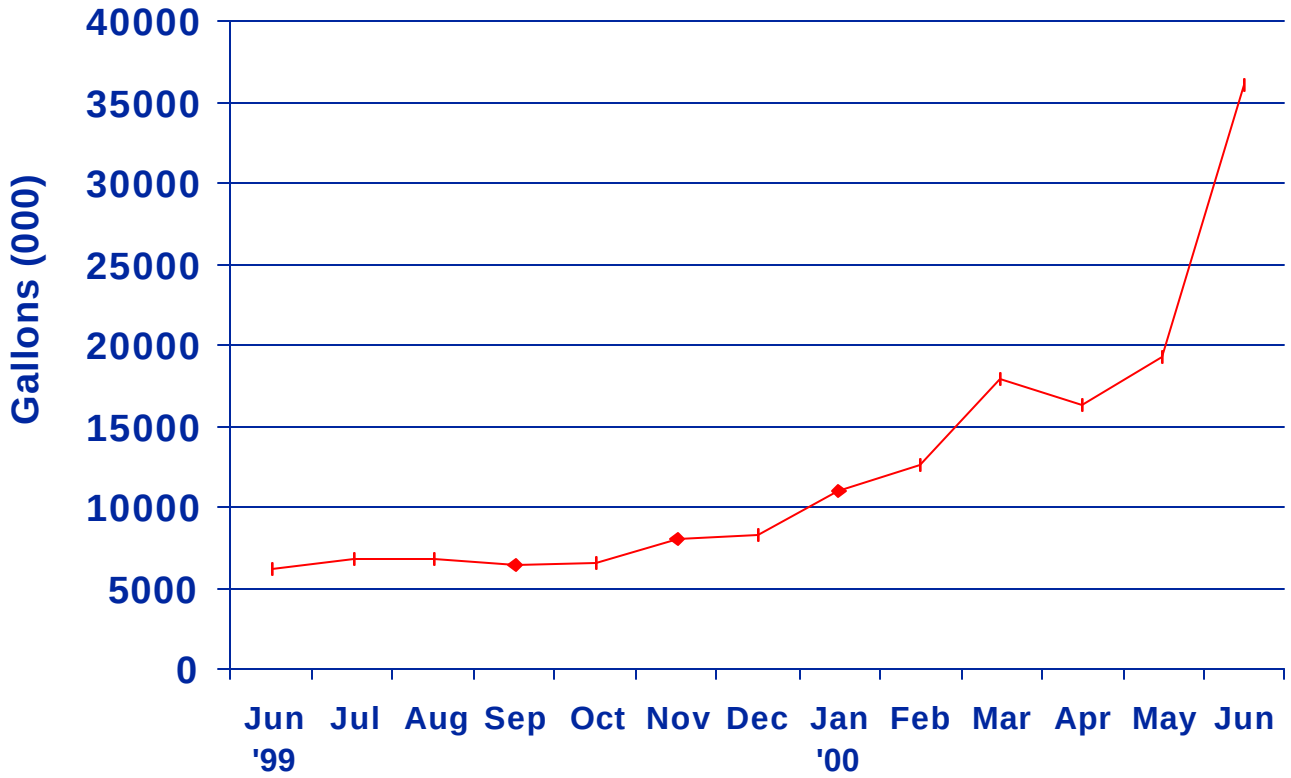
E85 Fueling Systems

- No high pressure fueling systems. Fuels same as gasoline
- All USTs that meet Dec. '98 EPA standards can be used to dispense E85.
- Ethanol does not interact well with aluminum, remove.
- Replace aluminum parts with stainless steel, nozzle, knobs, impeller, etc.
- Teflon hose
- 1 micron filter
- Modify existing unleaded system to dispense E85 for approx. $2,500

- National Fire Protection Association approved in NFPA 30 & 30A (same as gasoline).
- ASTM 5798 - 98a standard for E85
- Seasonally adjusted for volatility requirements in same fashion as gasoline to eliminate cold start problems and vapor lock difficulties
  - E85 during summer
  - E70 during winter

E85 Fuel Consumption

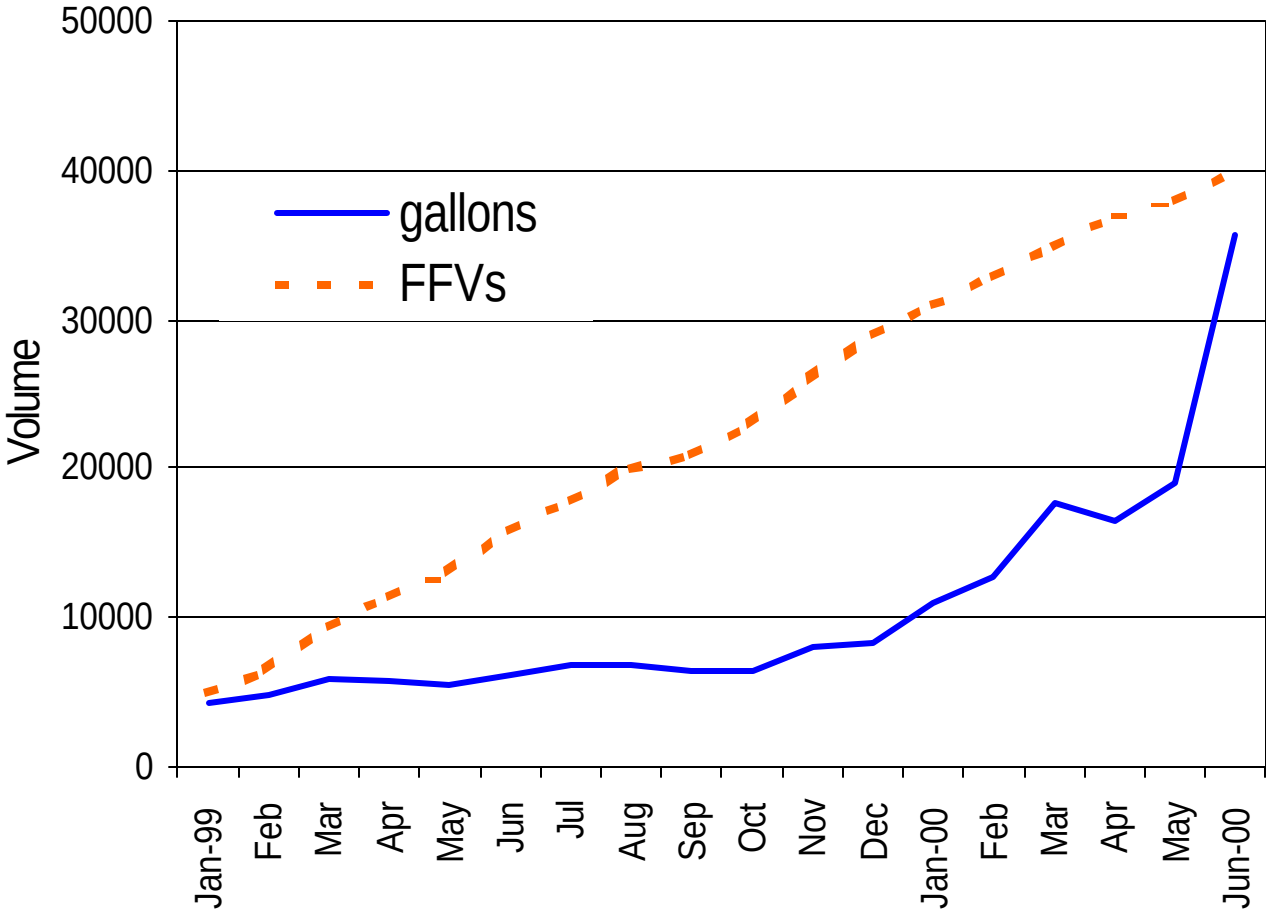
June 1999 thru June 2000



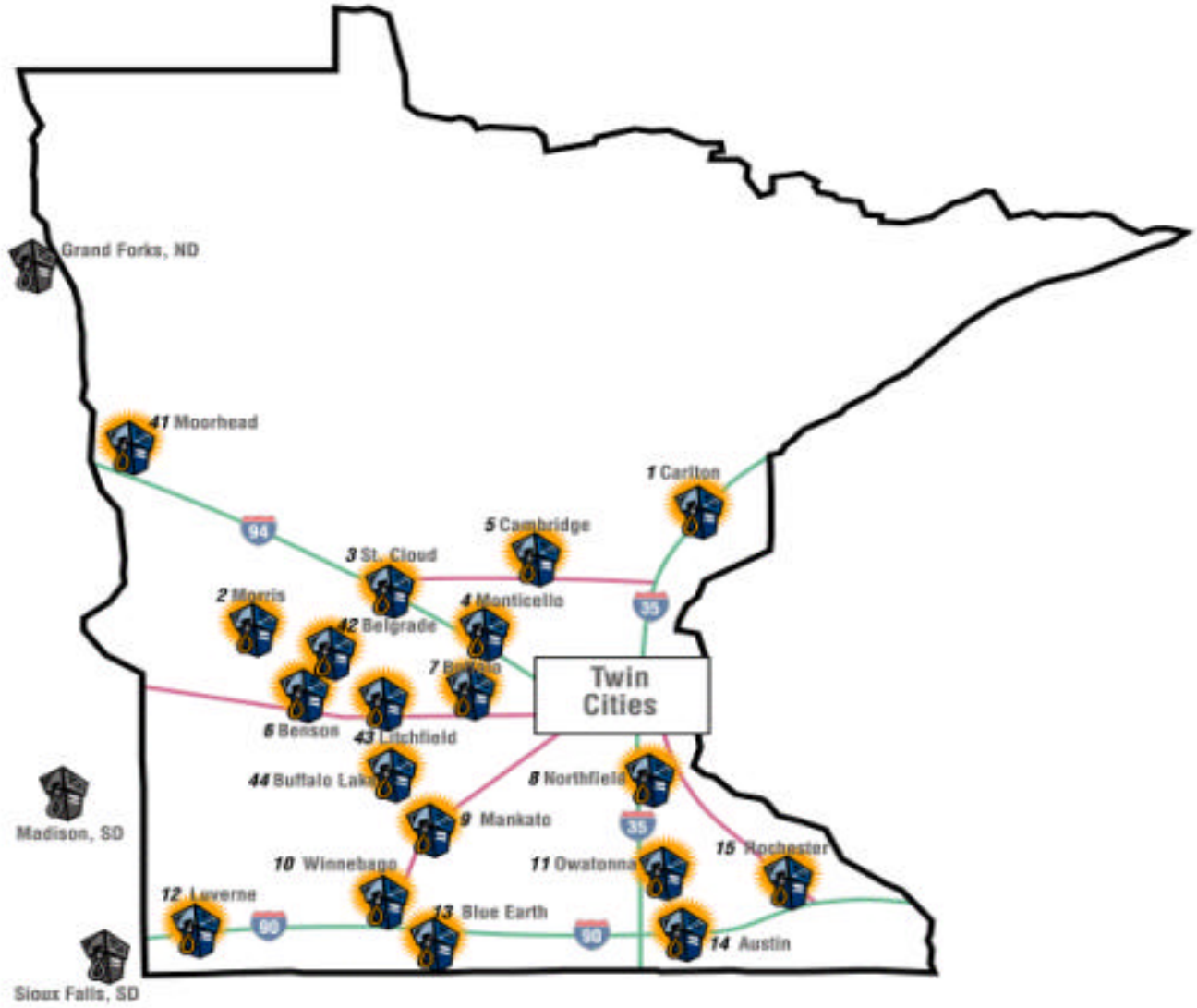
Price of E85 in MN, March 2000

E85 Fuel Consumption / FFV Sales

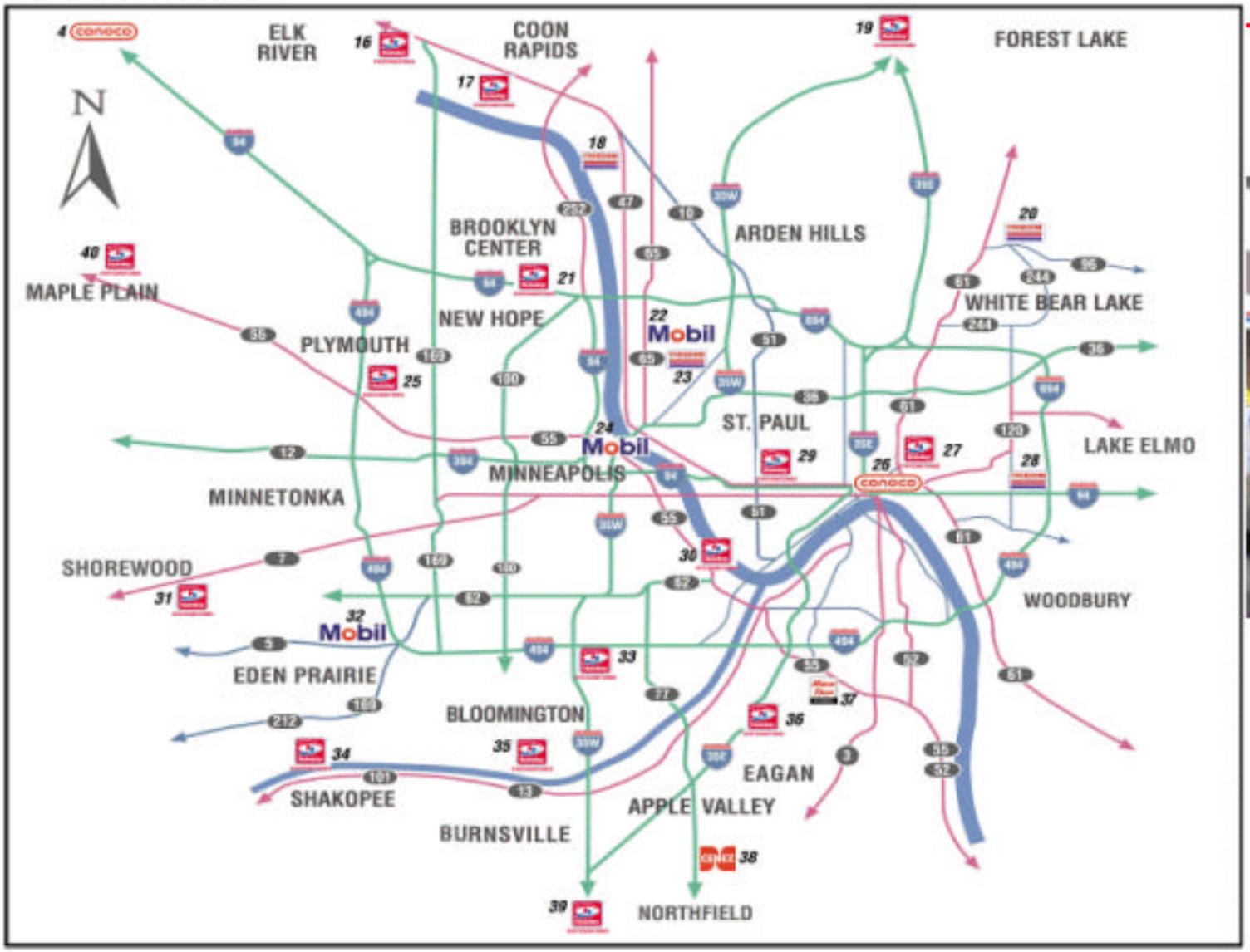
January 1999 thru June 2000



Minnesota E85 Stations



Twin Cities E85 Stations



NEVC Contacts

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National Ethanol Vehicle Coalition

DaimlerChrsler

E85 85% Ethanol

General Motors

BCI

AMERICAN LUNG ASSOCIATION of Minnesota

National Corn Growers Assn

Colorado Corn Growers Association

Missouri Corn Growers Association

Ford Motor Company

Questions and Answers